The model was implemented in PSE gPROMS Modelbuilder. Several simulations were carried out by changing flow arrangement (co-current, counter-current and cross-flow), operating conditions and stack features. Results showed that the model is able to reliably predict the effect of these variables on the performance of the ED unit investigated. In particular, the model was found capable of estimating the distribution of current density/voltage and concentration along the channels. In addition, stack resistance, overall and specific energy requirements were computed. Collected findings suggest that the model proposed might be a powerful tool to improve and optimise ED process.

Keywords: Electrodialysis, Multi-scale, Process simulator.

Acknowledgments
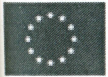
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Water chlorination using in situ electrolysis

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The effects of electrolysis on water are well known since the mid 19th century. This paper will presents the findings of the pilot studies conducted in Israel and Malta to measure the efficacy of in situ electrolytic chlorination of drinking water, especially with low levels of chlorides. The pilots were conducted using a newly developed water electrolysis system which includes a continuous automated self cleaning system. It was determined that this technology can be used as an alternative to hypochlorite dosage for drinking water desalination and can provide the necessary level of chlorine for disinfection. Based on the results, it is suggested that electrolysis can also be used to chlorinate the permeate of the desalination process.

Keywords: Water chlorination; Electrolysis; Electrode fouling